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MINOR ARTICLES OF FARM EQUIPMENT.

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MINOR ARTICLES OF FARM EQUIPMENT.

INTRODUCTION.

Among the leaks in farming to which because of their apparent unimportance little attention has been directed is the waste which occurs through a general lack of comprehension as to the extent and value of the minor articles which are necessary to the smooth running of a farm. This waste is exhibited in extra expense through the purchase of unnecessary tools and materials; in the loss of time and discounts in buying numerous articles singly or in small lots; in the loss, theft, and rapid depreciation of items of equipment considered too insignificant to require systematic care; and in the losses in many directions through the lack or the misplacement of equipment at times when it is urgently needed.

A previous publication[a] has to a greater or less extent emphasized all the foregoing points in discussing the advantages to be gained by having on the farm at all times the workshop tools and materials necessary for keeping in a high state of efficiency the equipment upon which the successful management of the modern farm so largely depends. It is the purpose of this paper to lay even greater emphasis upon certain of these points and to present the results of a study made for the purpose of determining the number and cost of all minor articles of equipment necessary for a farm of the general type. This study did not include wagons, machinery, or other articles which on account of their bulk or value would be classed as items of major importance, but was confined to the consideration of the miscellaneous small tools, utensils, and sundries usually purchased singly or in small lots at a slight cost for each.

The total cost of the miscellaneous articles is usually much higher than the estimates given by farmers and writers on agricultural

[a] Farmers' Bulletin 347, U. S. Dept. of Agriculture, entitled "The Repair of Farm Equipment." This bulletin discusses the importance of making minor repairs on the farm, the character and use of tools, and the proper workshop facilities and materials for repair work. It will be sent free of charge upon application to the Secretary of Agriculture, Washington, D. C.

subjects, but owing to the great number of small purchases made this fact is seldom realized except by the few who have made careful inventories at stated intervals. Ignorance of this fact leads farmers in general to neglect an extremely valuable portion of their equipment, and it would probably be found that the decrease in value of the small articles is much more rapid than that of the major items, for which an annual rate of depreciation of 7.3 per cent has been established.[a] The low estimates regarding this part of the equipment also prove disappointing to the manager of a new farming venture who finds it necessary to make an increased outlay on this account, attended by a readjustment of his plans.

The importance of having a good working equipment in small articles and the absolute necessity of caring for it are matters which should be apparent to the thoughtful farmer and need not be dwelt upon further. The waste of time in making numerous special trips for small articles is also apparent, particularly when it is considered that many of these occur in the busiest seasons. This could be avoided to a large extent by taking an inventory during a slack period and replacing all missing items at the first opportunity. Concerning the loss through ignorance of the equipment needed, however, less has been said, and it is in regard to the requirement in the way of miscellaneous articles and their purchase that this paper will be largely devoted.

In selecting the minor equipment for a given farm consideration must be given not only to the articles needed for the care and repair of buildings, fences, machinery, etc., but to those used for the care of live stock, the production of crops, and the various other interests of the farm. With every change in the type of farm involving a new combination of enterprises, a change in minor equipment will be necessary. For each of the many specialized types of farms certain articles will be needed which will not be found necessary on farms generally. To attempt to determine the equipment in small items necessary for all these special types is beyond the scope of this paper, which will attempt to cover only those items found in most common use on farms of the general type. By this is meant farms of moderate size on which both crops and live stock are raised without particular emphasis on the production or disposition of any one product.

The nature of the minor equipment will be determined largely by the character of the farm enterprises and the proximity of repair and shopping facilities, while its extent may be governed by the size of the farm, the number of workmen, and the financial circumstances of the proprietor. Perhaps both the nature and the extent of the

[a] Bulletin 73, Bureau of Statistics, U. S. Dept. of Agriculture.

minor equipment will be influenced most by the farmer's attitude in regard to small economies and his ability to use tools to the best advantage.

EXTENT OF MINOR EQUIPMENT.

For the purpose of ascertaining how much of the miscellaneous equipment discussed is necessary on general farms, the annual inventories on the farms of thirty-three cooperators in Ohio were made as complete as possible with respect to minor items. These farms include one poultry, truck, and general farm, one large horse farm, and a number on which dairying is the principal enterprise, yet none depart radically from the general type. The average size is a trifle less than 167 acres, and the average equipment as nearly as can be determined is given in tabular form on subsequent pages of this circular.

SUMMARY OF INVENTORIES.

Table 1, showing a summary of the inventories of minor equipment, must be studied closely in order to be of the greatest value. Not all the items listed are necessary for a satisfactory farm equipment, and on no farm was a complete list found. No farm combined all the enterprises represented, yet every item in the list was found on one or more of the cooperating farms. A few articles were omitted as being of an extremely unusual character. Many items which might be called farm equipment because found in farm rather than in town homes are not included, the aim being to present a suggestive list of miscellaneous farm tools, etc., for the convenience of the farm manager. The use of the various tools is not described, as only the more common ones, with which local merchants are usually familiar, have been included.

The table is designed to show the relative importance of the various items and approximately what is required for a complete equipment. The first column shows the percentage of the whole number of farms from which each article was reported in the inventories. It is probable that in many cases there should be a slight increase in the percentage shown, owing to failure to record all the articles on some of the farms. It is believed to be correct, however, in showing the relative importance of the different articles. In column 2 is shown the average number of each article on the farms which report the same. In column 3 is the number which the inventories suggest as approximately the average for a well-equipped general farm under the conditions obtaining in Ohio. In making up this number it has been necessary to consider the percentage of farms reporting each article, the average number of articles for each farm

reporting, and the same average for the whole number of farms. The suggested number is the nearest whole number to the mean found between the two averages. For example, the T-handled wood auger is reported from 22 out of 33 farms, or 67 per cent. A total of 67 augers was found on these farms, or 3.04 for each farm reporting, and 2.03 to the farm for the whole number. The mean is 2.54 and the suggested number 3. With one or two exceptions no article is included in column 3, however, which was not reported from at least 20 per cent of the farms and for which the average to the farm for the whole number of farms was less than three-tenths. In this way consideration was given to the fact that on some farms certain items are not reported and that on farms which do report the various items there are undoubtedly cases in which fewer articles than those found would be adequate. This last statement is certainly true, since in many cases where several tools of a kind are kept, a part are old and are retained simply for occasional use. The arbitrary basis given was adopted because it was found to mark quite accurately the dividing line between what was considered essential and what nonessential by the owners of several well-equipped farms. Column 3 is not necessarily a recommendation as to what will be urgently needed for a farm of average size and type, but it is indicative of the number of articles suggested by the inventory. By carefully considering the needs of his farm the manager can cut down the list materially. The oil cans, wrenches, eveners, etc., purchased with machines were excluded wherever practicable from the inventories; hence, the suggested number is less in many cases than the real total for such items.

In column 4, figures are given for the first cost of the various articles, the price of all being included for reference, even though all of the articles are not recommended for use. The price for the complete article (for example, a tool with a handle) is given in most cases. This price has been obtained wherever possible from merchants located in sections from which the inventories were taken. The majority of hardware items were priced by one of the leading hardware merchants of Wayne County, Ohio. Other prices were obtained from Farmers' Bulletin 347. Still others were supplied by various farmers who had purchased or made similar items within a few months of the date of inventory. These prices will, of course, vary a great deal with the location of the purchaser and the quality of the goods. Regarding the latter, however, the point was emphasized in obtaining prices that average figures were wanted for the quality of goods usually purchased by farmers. These prices are merely suggestive and can not in all cases be relied upon, for the reasons just mentioned.

The total cost of the various items suggested is extended in column 5. The total, which seems extremely large in comparison with the usual estimates, is, however, not unreasonable if a rather complete equipment is desired. Taking the grand total inventory of items mentioned in this list for all the farms, using the prices given in column 4 and dividing by 33, the first cost for the average farm of 167 acres is found to be about $190. The discrepancy between this figure and that given for the total cost of items suggested, $270.70, may be due partly to incomplete inventories but more to the fact that the latter figures contain a large number of single articles for which the mean previously mentioned was a fraction greater than one-half and less than one. Column 5 indicates a rather complete outfit. Neither the $190 nor the $270.70, however, includes any allowance for a stock of materials for the repair of equipment, as given in Farmers' Bulletin 347. An expenditure of $50 or more in this connection would save many trips to town for materials, even if the equipment for making use of them were complete. Many items considered useful and necessary might be added to the list suggested, but the purpose of this circular is to establish what might be called a working basis for considering this phase of equipment. The occasional need for many of these omitted items will be apparent, and attention is called to the fact that the list in column 3 contains only 158 out of 240 articles, all of which were considered necessary in certain cases. The initial expense if all the items were included in as large numbers as shown in column 2 would be over $685, and it is not an uncommon thing to find farms in the United States on which the actual investment in small and miscellaneous articles would be above this figure if all the tools had been bought first hand. The summary of the thirty-three inventories is given as follows:

TABLE I.—*Summary of items of minor equipment reported on thirty-three farms in Ohio, with the number and cost of all items suggested as necessary and their total cost.*

Items.	1	2	3	4	5
	Percentage of farms reporting.	Average number of items per farm reporting.	Number of each item suggested as necessary.	Cost of each item.	Total cost of items suggested as necessary.
General purpose:					
Auger	97	3.0	3	$0.25	$0.75
Awl	27	1.9	1	.10	.10
Ax and handle	88	2.1	2	1.25	2.50
Pinch bar	24	1.1	1	.75	.75
Bench screw	15	1.0	1	.50	.50
Auger bit	94	6.7	7	.30	2.00
Bit brace	94	1.2	1	1.50	1.50
Steel square	24	1.1	1	.75	.75
Bevel square	24	1.0	1	.40	.40
Try-square	12	1.0	1	.25	.25
Wood chisel	9	1.3	1	.10	.50

TABLE I.—*Summary of items of minor equipment reported on thirty-three farms in Ohio, with the number and cost of all items suggested as necessary and their total cost*—Cont'd.

Items.	1 Percentage of farms reporting.	2 Average number of items per farm reporting.	3 Number of each item suggested as necessary.	4 Cost of each item.	5 Total cost of items suggested as necessary.
General purpose—Continued.					
Compass	42	1.0	1	$0.30	$0.30
Level	64	1.2	1	.75	.75
Drawing knife	91	1.3	1	.75	.75
Scratch gauge	45	1.4	1	.40	.40
Gimlet bits	55	3.0	2	.20	.40
Grub hoe	21	1.1	....	.50	.....
Claw hammer	82	1.3	1	.50	.50
Hand ax	36	1.0	1	.50	.50
Hatchet	70	1.4	1	.75	.75
Screw-driver	67	1.7	1	.25	.25
Log chain	82	2.5	2	1.50	3.00
Wooden mallet	36	1.5	1	.25	.25
Mattock	79	1.4	1	.75	.75
Compass saw	42	1.0	1	.30	.30
Handsaw	94	1.7	2	1.25	2.50
Crosscut saw, large	85	1.2	1	3.00	3.00
Plane	73	2.3	2	1.25	2.50
Iron wedge	79	2.5	2	.30	.60
Tapeline	39	1.1	1	.50	.50
Rasp	39	1.1	1	.50	.50
Brush hook or scythe	21	1.0	....	1.25	.....
Cant hook	42	1.4	1	1.25	1.25
Chalk line	27	1.0	1	.10	.10
Buck saw	10	1.0	....	.75	.....
Carpenter's pincers	30	1.2	1	.60	.60
Anvil	21	1.0	....	10.00	.....
Vise	15	1.2	....	5.50	.....
Forge	3	1.0	....	16.00	.....
Combination drill press	23	1.0	1	4.00	4.00
Drills	27	3.9	4	.50	2.00
Tinner's snips	18	1.0	....	1.25	.....
Cold chisel	73	2.3	2	.20	.40
Whetstone	24	1.8	1	.10	.10
Screw plate	27	1.0	1	10.00	10.00
Tongs	6	2.0	....	.50	.....
Flat file	70	2.0	2	.15	.30
Round file	35	1.5	1	.30	.30
Taper file	42	2.2	2	.10	.20
Oil can	30	1.7	1	.10	.10
Machine oil	61	[a] 1.8	[a] 1	.30	.30
Pipe wrench	24	1.3	1	1.50	1.50
Monkey wrench	64	2.1	2	.50	1.00
Tool grinder	30	1.0	1	3.00	3.00
Grindstone	91	1.0	1	4.00	4.00
Riveting hammer	39	1.5	1	.75	.75
Sledge hammer	33	1.1	1	1.00	1.00
Pliers	67	1.4	1	.50	.50
Nippers	52	1.5	1	1.00	1.00
Punch	33	2.2	2	.15	.30
Hack saw	18	1.0	....	.50	.....
Saw-set	36	1.0	1	.60	.60
Maul	16	1.0	....	.60	.....
Post-hole digger	41	1.5	1	1.25	1.25
Wire splicer	11	1.3	....	1.00	.....
Wire stretcher	29	1.1	1	1.00	1.00
Ditch cleaner	22	1.0	1	1.25	1.25
Tile spade	31	1.6	1	1.00	1.00
Brick trowel	41	1.4	1	.40	.40
Plastering trowel	6	1.0	....	1.00	.....
Sand sieve	16	1.4	....	.50	.....
Pick	31	1.9	1	1.00	1.00
D-handled shovel	31	1.1	1	1.00	1.00
Long-handled shovel	13	1.3	....	1.00	.....
Counter scale	16	1.0	....	5.00	.....
Spring balance	34	1.1	1	.50	.50
Steelyards	28	1.1	1	2.00	2.00
Platform scale	38	1.0	1	8.00	8.00
Rat trap	24	1.0	1	.50	.50
Steel trap	26	2.1	1	.15	.15
Jackscrew	3	3.0	....	2.00	.....
Stepladder	45	1.1	1	1.75	1.75

[a] Gallons.

TABLE 1.—*Summary of items of minor equipment reported on thirty-three farms in Ohio, with the number and cost of all items suggested as necessary and their total cost*—Cont'd

Items.	1 Percentage of farms reporting.	2 Average number of items per farm reporting.	3 Number of each item suggested as necessary.	4 Cost of each item.	5 Total cost of items suggested as necessary.
General purpose—Continued.					
Ladder	52	1.4	1	$2.00	$2.00
Farm bell	58	1.0	1	2.00	2.00
Lantern	68	1.8	2	.90	1.80
Hoisting block	16	2.2		2.00	
Barrel	71	4.0	3	.75	2.25
Padlock	39	1.8	1	.40	.40
Paint brush	18	3.3	2	.30	.60
Whitewash brush	26	3.4	1	.75	.75
Basket	52	3.8	4	.30	1.20
Household and farm.					
Lard press and sausage stuffer	45	1.0	1	5.50	5.50
Sausage grinder	48	1.0	1	2.00	2.00
Hog scraper	10	2.8	2	.10	.20
Hog hook	29	1.1	1	.65	.65
Butcher knife	52	2.4	2	.30	.60
Kettle	55	1.7	1	2.50	2.50
Tree pruner	15	1.2		1.50	
Pruning shears	39	1.3	1	.40	.40
Crates	39	54.7	40	.40	16.00
Garden rake	61	1.2	1	.50	.50
Hoe	88	2.4	2	.40	.80
Cultivator	12	1.3		4.00	
Trowel	12	1.3		.25	
Cold frame	3	8.0		2.50	
Flat	9	4.0		.40	
Spade	30	1.4		.75	
Sprinkler	24	1.4		.50	
Lawn mower	64	2.0	1	4.00	4.00
Lawn rake	24	1.0		.40	
All stock:					
Broom	9	2.0		.30	
Clipping machine	15	1.0		6.00	
Manure fork	42	2.6	2	.70	1.40
Pail	27	4.1	3	.15	.45
Tie chain	18	5.3	3	.25	.75
Tie rope	9	2.3		.25	
Hand sprayer	42	1.0		.75	
Wheelbarrow	42	1.1	1	4.00	4.00
Horse and driving:					
Bit	46	2.4	2	.40	.80
Blanket	91	2.8	3	2.00	6.00
Brush	89	2.0	2	.50	1.00
Currycomb	89	2.3	2	.25	.50
Collar	43	2.7	2	3.00	6.00
Harness oil	31	[a] 1.5	[a] 2	.25	.50
Fly nets	31	2.8	2	1.00	2.00
Halters	97	6.5	6	.75	4.50
Muzzle	26	1.8	2	.20	.40
Nosebag	14	1.4		.50	
Sweat pad	37	2.2	2	.35	.70
Harness punch	69	1.2	1	.50	.50
Riveting machine	69	1.0	1	.50	.50
Rivets	43	[b] 1.2	[b] 1	.10	.10
Tie rope	31	2.8	2	.15	.30
Saddle	57	1.0	1	10.00	10.00
Riding bridle	23	1.3	1	1.00	1.00
Snaps	23	7.4	4	.05	.20
Sponge	14	2.0	1	.10	.10
Neck straps	43	1.9	1	.75	.75
Syringe	23	1.1	1	.60	.60
Storm apron	17	1.2	1	.75	.75
Buggy jack	10	1.3	1	.75	.75
Wagon jack	14	1.0	1	4.00	
Clevis	40	4.3	3	.10	.30
Chamois skin	11	1.0	1	.50	
Dust robe	62	1.2	1	1.00	1.00
Lap robe	71	1.6	1	5.00	5.00
Evener, 2-horse	60	2.0	2	1.50	3.00
Evener, 3 or 4 horse	63	1.5	1	2.00	2.00
Storm front	46	1.1	1	4.00	4.00
Dash lantern	23	1.0	1	1.00	1.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[a] Quart.

[b] Dozen.

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TABLE I.—*Summary of items of minor equipment reported on thirty-three farms in Ohio, with the number and cost of all items suggested as necessary and their total cost*—Cont'd.

Items.	1 Percentage of farms reporting.	2 Average number of items per farm reporting.	3 Number of each item suggested as necessary.	4 Cost of each item.	5 Total cost of items suggested as necessary.
Horse and driving—Continued.					
Neck yoke	14	1.6	1	$1.00	$1.00
Whippletree	29	3.1	2	.30	.60
Whip	60	1.4	1	.50	.50
Whisk broom	11	1.0		.10	
Cattle:					
Cow bell	6	1.5		.25	
Calf muzzle	3	1.0		.20	
Crate	3	1.0		.50	
Tie rope or chain	39	3.9	3	.30	.90
Dehorning clipper	9	1.0		5.00	
Milk tube	15	1.0		.25	
Dairy:					
Milk can	36	4.9	4	1.50	6.00
Milk crock	27	9.9	7	.10	.70
Milk pan	6	5.0		.20	
Milk pail	70	3.2	3	.50	1.50
Churn	45	1.1	1	4.00	4.00
Butter crock	21	10.1	6	.20	1.20
Butter bowl	21	1.0		.50	
Butter scales	6	1.0		1.50	
Strainer	30	1.0	1	.50	.50
Skimmer	6	1.0		.10	
Thermometer	24	1.0	1	.25	.25
Sheep:					
Bell	12	5.0	3	.15	.45
Shears	48	1.6	1	1.00	1.00
Swine:					
Ring plier	58	1.1	1	.20	.20
Rings			[a] 1	.10	.10
Snout clipper	3	1.0		.40	
Tongs	3	1.0		.50	
Crate	15	2.0		1.00	
Portable house	39	6.6	5	4.00	20.00
Poultry:					
Fountain	6	3.5		.25	
Feed hopper	3	3.0		.25	
Trap nests	3	8.0		.25	
Feed pan	3	6.0		.05	
Feed sieve	3	1.0		.25	
Hover box	3	6.0		.25	
Egg tester	6	1.0		.15	
Coop	3	3.0		3.00	
Leg bands	6	50.5			
Bone cutter	6	1.0		6.00	
Bees:					
Foundation	6	[b] 6.0		.75	
Section box (100)	12	2.8		.75	
Foundation fastener	9	1.0		.75	
Hive	15	19.6		1.00	
Super	12	30.3		.50	
Smoker	12	1.0		1.00	
Bee escape	6	2.0		.25	
Bee veil	9	1.3		.10	
Honey crate	6	13.5		.25	
Honey extractor	6	1.0		3.50	
Corn:					
Shock tier	27	1.0	1	.50	.50
Knife	70	2.7	2	.25	.50
Hand planter	61	1.3	1	1.50	1.50
Ensilage fork	6	1.0		1.00	
Seed tester	12	1.5	1	.50	.50
Seed rack	9	1.3		1.00	
Husking peg	30	2.9	2	.10	.20
Husking gloves	12	[c] 1.3		.75	
Hay:					
Stack cover	3	2.0		8.00	
Carrier	30	1.1	1	3.00	3.00
Hoisting fork	58	1.1	1	1.25	1.25
Pulleys	55	4.5	4	.40	1.60

[a] Box. [b] Pounds. [c] Pairs.

TABLE 1.—*Summary of items of minor equipment reported on thirty-three farms in Ohio with the number and cost of all items suggested as necessary and their total cost.*—Cont'd.

Item	1 Percentage of farms reporting	2 Average number of items per farm reporting	3 Number of each item suggested as necessary	4 Cost per each item	5 Total cost of items suggested as necessary
Hay—Continued.					
Hay rope, 1-inch	61	3.2	3		85.00
Trip rope, ½-inch	30	2.0	2		4.00
Hand fork	88	3.2	3	$0.60	1.80
Baled hay hook	21	1.6	1	.30	.30
Scythe and snath	88	1.4	1	1.25	1.25
Hand secker	70	1.1	1	5.00	5.00
Sickle	32	1.1	1	.50	.50
Slings	9	2.7		2.00	
Knife	67	1.2	1	.75	.75
Small grain and seed:					
Cradle	48	1.0	1	5.00	5.00
Binder cover	36	1.0	1	3.00	3.00
Flail	15	1.6			
Measure	33	1.4	1	.40	.40
Straw fork	15	1.2		.50	
Hand rake	36	1.3	1	.25	.25
Sacks	97	38.6	38	.20	7.60
Scoop shovel	82	1.7	2	1.00	2.00
Sugar beets:					
Beet fork	3	2.0		1.50	
Beet hoe	3	6.0		.50	
Beet topper	3	9.0		.25	
Potatoes:					
Scoop	3	1.0		1.50	
Fork or hook	39	1.4	1	1.50	1.50
Hand planter	3	1.0		1.75	
Maple sugar:					
Sap bucket	21	171.0		.20	
Spout	15	185.0		.03	
Cover	3	500.0		.06	
Scoop	12	1.0		1.00	
Gathering pail	12	2.5		.75	
Tapping bit	9	2.0		.30	
Total cost of items suggested as necessary					270.70

[1] Feet.

A careful study of Table 1 will bring out many points worthy of consideration. To the owner of a farm who has had no occasion from time to time to collect his miscellaneous equipment and take account of its extent, this study should suggest the advisability of taking an annual inventory of the small as well as of the large equipment in order to keep track of his investment. The practice of taking an inventory, even of the larger pieces of machinery, is not as common as it should be, and in many cases where an invoice is taken the "small stuff" is lumped in one item. During the process of taking the inventories used in compiling this circular the owner almost invariably expressed astonishment at the extent to which his capital was invested in miscellaneous minor articles.

The tenant farmers, and especially those who have frequent occasion to move, will ordinarily be found better posted as to the extent of their miscellaneous equipment, and this will usually be found to be

much nearer the actual necessities than the equipment of the resident owner. To both of these classes, however, it is earnestly recommended that following an inventory for the purpose of determining the number and the value of articles on hand there should be provision made for keeping track of the various articles in a systematic manner. Only in this way can loss through theft and carelessness be avoided and time saved through a knowledge of where the articles can be found when wanted, while expenditures for the duplication of items when the original articles can not be found for the time being will be rendered unnecessary and depreciation on account of neglect will be reduced to a minimum. It is unnecessary to dwell upon these points, as they will be apparent to the businesslike farmer.

This list also contains possibilities of great value to the prospective farmer. To the ordinary person the compiling of a complete list of articles necessary for use on an average-sized general farm becomes almost an impossibility after he has listed the larger items, such as machinery, wagons, etc. This applies to the man with some farm experience as well as to the one who engages in farming for the first time. The experience of several men born and raised on a farm and temporarily separated from it during a college course will bear out this statement. One of these was actually in charge of an experimental farm for four years prior to taking up farming on his own account, yet his initial allowance for small tools and sundries was only $25. After going over an incomplete list similar to the foregoing he purchased a very modest lot of small tools, amounting to over $100 in value, from a local hardware dealer, thereby obtaining a cash discount of 10 per cent.

A recent graduate of the Ohio State University, before engaging in farming on his own account on a portion of his father's farm, kept in mind for four or five months the problem of getting a complete equipment within his means. He first noted all the items which he considered necessary, basing his list on his previous experience. His second step consisted of the task of obtaining the net retail prices of the various articles. The result was a total so large that the third and most difficult step, that of determining the actual necessities, was pursued for a considerable time. Having finally reduced his list to the minimum, he entered into negotiations with several of the local merchants. Two of these made special efforts to obtain his order, and each made the suggestion that he take a trip at the merchant's expense to one of the cities in the State and select his equipment from the large stocks in the wholesale supply houses. He accepted one of these offers, and during the state fair spent a half day in a large warehouse selecting articles of the style and quality desired. The goods were shipped to the local dealer, who obtained his profit and

still gave the purchaser a cash discount of 10 per cent from the ordinary prices. The young farmer brought his entire stock of miscellaneous equipment from the store at one trip with a team and wagon, and then spent a day or two arranging his workshop and disposing of his various purchases in the most convenient places, the extent of his outlay impressing him with the necessity for taking systematic care of the smallest details. Several items which were not up to the standard were taken back and exchanged for perfect goods at the local store, and in this way the entire outfit was delivered at the farm with very little expenditure of time and annoyance and in perfect condition. By following this method the farmer was enabled to make his selection from well-known brands and from a larger stock than that afforded by the ordinary store, besides having a pleasant outing. His total purchase amounted to about $125, a portion being for household use.

The following articles were charged against the farm business:

1 leather halter	$1.65	1 handsaw	$0.90
1 gallon of paint	1.50	1 hack saw	.45
1 gallon of barn paint	.85	1 compass saw	.25
1 bottle of machine oil	.10	1 pair of pliers	1.00
1 small oil can	.05	1 pair of pliers	.30
1 leather punch	.60	1 post-hole digger	1.25
2 pairs of gloves	.20	1 screw-driver	.35
1 pair of shucking gloves	.50	2 shovels	1.20
1 shucking peg	.20	1 scoop shovel	.75
1 riveting machine	.50	1 plastering trowel	.62
1 soldering iron	.30	2 wedges	.40
1 crowbar, 16 pounds	.64	1 fork, 3 prongs	.65
1 center punch	.10	1 whetstone	.05
1 draw knife	.60	1 mail box	1.00
1 garden hoe	.35	1 wagon jack	1.00
1 grindstone	3.75	1 bucket	.65
1 buggy robe	8.00	1 set of ladder irons	1.35
1 blacksmith's vise, 5-inch	6.00	12 bolts, 14-inch	.49
1 tamper	1.00	1 horse blanket	3.00
1 pair scales, 600 pounds	11.00	1 whip	.25
1 oilstone	.50	1 monkey wrench	.40
2 gallons of harness oil	2.00	1 alligator wrench	.25
1 jack plane	2.00	1 paint brush	.15
1 paint brush	.65	1 seed sower	4.50
1 ratchet brace	1.75	1 saw-set	.60
1 bit, $\frac{1}{4}$-inch	.20	1 log chain, 15 feet	1.72
1 bit, $\frac{5}{16}$-inch	.20	1 ax and handle	1.00
1 bit, $\frac{7}{16}$-inch	.20	1 boy's ax	.75
1 bit, $\frac{1}{2}$-inch	.25	1 cold chisel	.20
1 bit, $\frac{9}{16}$-inch	.30	1 chisel, $\frac{1}{4}$-inch	.30
1 bit, $\frac{3}{4}$-inch	.30	1 chisel, 1-inch	.35
1 bit, 1-inch	.40	1 rope, $\frac{1}{2}$-inch, 50 feet	.55
1 handsaw	1.75	1 hoisting block	2.50

1 tinner's snips	$0.35
1 road scraper	5.00
1 steel square	.85
1 nail hammer	.75
1 ball peen hammer	.75
1 jackscrew	2.25
1 pipe wrench	1.50
1 currycomb	.20
3 clevises	.24
1 crosscut saw and handle	2.80
5 files	.75
1 grub hoe	.45
1 garden hoe	.35
1 horse brush	.45
1 horse brush (for tail)	.15
1 hatchet	.75
1 lantern	.90
1 fork, 4 prongs	.60
1 punch	.10
1 pick and handle	$0.60
2 boxes of copper rivets	.20
2 boxes of tubular rivets	.10
1 spade	.60
1 ditching spade	1.00
1 snath	.75
1 scythe	.75
1 wheelbarrow	1.75
1 hay knife	.75
1 feed basket	.80
1 pair of nippers	.75
1 sledge and handle	.90
3 quarts of paint	1.15
Total	106.86
Less 10 per cent cash discount	10.69
Net cost	96.17

A similar course to that just described might well be pursued by many persons who are about to engage in general farming. As before stated, the saving through the merchant's discount is considerable. The merchant who furnished the majority of the prices contained in Table I stated that for a large bill of goods such as that under discussion he could afford to give from 10 to 20 per cent discount for cash on account of the size of the order and the saving in the cost of selling. This would pay interest on the investment for some years, to say nothing of the time which would be saved through having the stock complete at the beginning.

On nearly every farm some articles will be found which have been bought at second hand. No doubt a considerable saving may be effected by thus securing articles at odd times when work is not pressing. If, however, the business of the farm is stopped during attendance at a sale it is an open question whether the saving on minor items over the suggested method will be sufficient to cover the time spent. As a rule these articles are summed up in the sale bill as "too numerous to mention" and no idea is given as to the extent or condition of the offering.

The lists here given are in the nature of a census in that they present data from which each individual may secure the information suited to his own use. These lists are printed with that object in view rather than as a recommendation of what should be purchased. Farmers' Bulletin 347, following a discussion of the various workshop tools, states that the complete equipment of a shop for the making of general farm repairs should include a blacksmithing outfit, a $25 collection of wood-working and general-purpose tools, a pipe-working combination, miscellaneous tools, a harness-repair outfit,

a workbench, a pair of sawhorses, and a grindstone, and that this entire equipment for a shop can be secured for about $100 in a fair quality of goods, while for $150 tools of excellent quality can be obtained.

The great number of general-purpose items, other than those mentioned, together with those for use in connection with the producing enterprises, and the stock of materials needed for the repair of farm equipment will easily bring the total cost of a good working equipment in miscellaneous articles up to $250. The expenditure of this sum for this purpose in the organization of the farm is probably out of the question for many farmers, but due consideration at the outset for the necessary investment in minor items will save much inconvenience and disappointment later.

SUMMARY.

Few farmers realize the extent of their investment in small items of equipment or the time and inconvenience involved in buying numerous articles singly or in small lots. Before planning the farm equipment, due consideration should be given to the necessary outlay for minor items, and where possible the latter should be secured at one purchase, thereby saving time and, usually, money. The purchase of these articles in such a manner will mean a total expenditure sufficient to impress the farmer with the need for their systematic care. The minor items for a general farm of 160 acres in Ohio and other middle Western States will probably cost from $200 to $300.

Approved:

JAMES WILSON,
Secretary of Agriculture.

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